

COMPARATIVE STUDIES OF FOUR-RING MESOGENS CONTAINING P-CARBORANE, BICYCLO[2.2.2]OCTANE, CYCLOHEXANE AND BENZENE,
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A series of esters was prepared from pentyl substituted p-carborane, bicyclo[2.2.2]octane, cyclohexane, and benzene carboxylic acids and three substituted phenols. The mesogenic properties of the esters were examined using thermal analysis and optical microscopy. The structure-mesogenic properties relationships were analyzed by comparison between the series of esters. Carborane derivatives showed an increased stabilization of nematic phases, while the cyclohexane derivatives demonstrated the greatest diversity in smectic polymorphism (up to four phases). Clearing temperatures, T_{NI} , showed a trend of bicycle[2.2.2]octane > cyclohexane > benzene > carborane in the series of esters. Mesogenic properties such as clearing temperatures and polymorphism are largely defined by the rigidity of the phenol.

Jacob Vroman and Bryan Ringstrand were supported by NSF grant (DMR-0111657)